Essays

SUSTAINABLE ENERGY SUBSIDIES

BY
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In January 2013, the wind energy industry appeared to dodge a bullet when Congress extended the Production Tax Credit (PTC) for another year. For the first few months of 2013, however, wind power development stagnated while the industry awaited IRS guidance regarding implementation of the PTC. By the time the IRS issued the guidance in April 2013, the industry had lost significant time and opportunities to develop new facilities. The IRS guidance also seemed likely to spur a flurry of new development as developers race to meet the deadlines to qualify for the tax credits. Once again, the wind energy industry has found itself in the midst of a boom-and-bust development cycle. This is nothing new; Congress has consistently failed to provide renewable power with long-term or predictable support. This Essay explores how intermittent subsidies weaken the renewable energy sector by considering how the PTC has affected the wind energy industry. The Essay first explains why renewable power deserves continued government support, despite the objections of "free-market" advocates. The Essay then explains how intermittency exposes the renewable power sector to economic and political uncertainty that the fossil fuel industry avoids. Next, the Essay explores whether two proposals to alter wind power subsidies will provide the industry with more certainty. Finally, the Essay concludes that regardless of the precise details of subsidy reform, providing long-term predictability in wind subsidies will be essential to ensuring a more sustainable transition to renewable power.

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I. INTRODUCTION

On January 1, 2013, the wind power industry and advocates of renewable energy breathed a sigh of relief when Congress renewed the Production Tax Credit (PTC) for another year.[1] The wind power industry had sought an extension of this critical subsidy for more than a year, without any response from Congress. Midway through 2012, the failure to secure an extension had already adversely affected the industry.[2] By that point, it also appeared that a short-term extension would come too late to do any good, because the existing PTC required facilities to be placed in service to be eligible for tax credits—and wind projects often take more than a year to develop.[3] Congress nevertheless renewed the PTC for another year as part of the grand bargain to prevent the United States from going off the "fiscal cliff."[4] Moreover, Congress modified the eligibility requirements to allow facilities that began construction before 2014 to qualify for production tax

1 *See* American Taxpayer Relief Act of 2012, Pub. L. No. 112-240, § 407, 126 Stat. 2313, 2340 (amending I.R.C. §§ 45, 48). President Obama signed the renewal into law on January 2, 2013.

2 *See* Diane Cardwell, *Tax Credit in Doubt, Wind Power Industry is Withering*, N.Y. TIMES, Sept. 20, 2012, http://www.nytimes.com/2012/09/21/business/energy-environment/as-a-tax-credit-wanes-jobs-vanish-in-wind-power-industry.html (last visited Apr. 7, 2013).

3 I.R.C. § 45(a)(2) (2012); *see* Union of Concerned Scientists, *Production Tax Credit for Renewable Energy*, http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/production-tax-credit-for.html (last visited Apr. 7, 2013) (discussing the problems with short-term tax extensions); *see also* Howard A. Cooper, *Tax Credits for Electricity from Renewables — Updated*, 125 TAX NOTES 221, 234 (Oct. 12, 2009), *available at* http://www.troutmansanders.com/files/Uploads/Documents/My%20article%20from%20Tax%20Analysts.pdf (explaining that the Internal Revenue Service considers a facility to be placed in service when it is "in a condition or state of readiness and availability").

4 Matthew L. Wald, *The Wind Industry Gets to Draw Another Breath*, N.Y. TIMES: GREEN BLOG, Jan. 3, 2013, http://green.blogs.nytimes.com/2013/01/03/the-wind-industry-gets-to-draw-another-breath/?ref=windpower (last visited Apr. 7, 2013).

credits.[5] At first glance, it appeared that Congress's delay in extending the PTC would not significantly stifle wind power development.

However, by the middle of February 2013, analysts predicted that the PTC extension would offer little benefit to the wind power industry. In theory, by tying the tax-credit eligibility to the start of construction, rather than its completion, the PTC extension should have given wind developers more breathing room.[6] Yet, uncertainty about how the Internal Revenue Service (IRS) would implement the revised PTC led many wind energy companies to delay investing in new facilities.[7] Even without the uncertainty surrounding the IRS rules, it was unclear whether the revised PTC would promote significant development of new wind farms, given that it can take more than a year to negotiate the deals and secure the permits necessary to begin construction.[8] At most, it seemed likely that a one-year extension of the PTC would benefit companies that began wind projects in 2012 or earlier but, for some reason or another, failed to complete them in time.[9]

On April 15, 2013, the IRS finally issued its guidance regarding the activities that qualify as the "beginning of construction" to be eligible for the PTC extension.[10] Under the IRS guidance, the commencement of any "physical work of a significant nature" would qualify.[11] More importantly, facilities would also be eligible for the PTC under a "safe harbor" provision available to developers that pay or incur at least 5% of the total cost of a facility before January 1, 2014, and that make "continuous efforts to advance towards completion of the facility."[12] Thus, under the guidance, developers could begin building or investing in wind facilities by the end of 2013 to qualify for the PTC.

For the wind energy industry, the IRS guidance must have triggered great relief. The safe harbor provision would seemingly afford companies time to design new wind farms, secure permits, and negotiate contracts for turbines and electricity delivery. However, the IRS guidance may also lead to a boom cycle, in which prices spike as developers rush to meet the deadlines. At the end of the day, the IRS guidance will likely only perpetuate the cycle of uncertainty plaguing the wind energy industry.

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5 American Taxpayer Relief Act of 2012, § 407(a), 123 Stat. at 2340–41.

6 *See* Mark Del Franco, *Post-PTC Extension, Wind Energy Developers Face New Questions*, N. AM. WINDPOWER, Jan. 3, 2013, http://www.nawindpower.com/e107_plugins/content/content.php?content.10917#.USESIFpARq5 (last visited Apr. 7, 2013).

7 *See id.* (noting that developers are still "grappling with a host of issues," such as "the true definition of 'begin construction'").

8 *See* Edward D. Einowski, *PTC Extension: The 2013 Wind Challenge*, STOEL RIVES LLP, Jan. 8, 2013, http://www.stoel.com/showarticle.aspx?Show=10024 (last visited Apr. 7, 2013) (describing the time-consuming procurement process for wind development projects).

9 *See id.* (noting that the few requested proposals for sizable wind projects in December 2012 were motivated by factors unrelated to a possible PTC extension).

10 I.R.S. Notice 2013-29, Beginning of Construction for Purposes of the Renewable Electricity Production Tax Credit and Energy Investment Tax Credit (Apr. 15, 2013) [hereinafter IRS PTC Guidance], *available at* http://www.irs.gov/pub/irs-drop/n-13-29.pdf.

11 *Id.* §3.

12 *Id.* §5.

Unfortunately, uncertainty has become a recurring problem affecting renewable energy development in the United States. Rather than providing the renewable energy industry with assurance and a clear pathway toward growth, federal policy makers have used intermittent subsidies to support renewables. These on-and-off subsidies inject uncertainty into the industry and constrain renewable energy investment. Intermittency also makes renewable power politically vulnerable because, unlike fossil fuel power producers that benefit from permanent subsidies and the political inertia that allows them to perpetuate, renewable energy companies must regularly petition for affirmative renewals of their intermittent subsidies. These dynamics only exacerbate the uncertainty in the renewable power industry.

Opponents of subsidies have argued that these dynamics support elimination of the PTC and other renewable energy subsidies.[13] Their arguments, however, ignore the urgency of climate change. They also are premised on the unfounded notion that fossil fuels receive fewer subsidies than renewable power.[14] While it is true that renewable power facilities have benefitted significantly in recent years from subsidies like the PTC, historical fossil fuel subsidies eclipse recent government support for renewable energy.[15] Perhaps more importantly, the externalized costs of fossil fuels far outweigh the costs of any subsidies renewable energy sources have received. Indeed, although subsidies for renewable power will likely never offset the competitive advantages fossil fuels have received from lax regulation, they at least help to level the playing field and could ease the transition to a more sustainable electricity system.

This Essay explores the debate surrounding subsidies for renewable energy and focuses particularly on the role the PTC has played in promoting, and sometimes undermining, the wind energy industry. Part II of this Essay explains the essential role subsidies must play in promoting a transition to an electricity system powered by renewable energy sources, and explores why opponents of subsidies have failed to make a convincing case for allowing the "free market" to control energy choices. Having explained why subsidies matter greatly in the modern energy sector, Part III explains how the PTC's intermittency has affected the economic and political viability of the wind energy industry. Part IV then explores some alternatives to intermittent subsidies that could foster sustainability in the wind energy sector while allowing it to become more self-sufficient. Finally, this Essay

13 *See, e.g.*, Jason Stverak, Op-Ed., *The Truth About Wind Energy Subsidies: They Blow*, FORBES, Dec. 19, 2012, http://www.forbes.com/sites/realspin/2012/12/19/the-truth-about-wind-energy-subsidies-they-blow (last visited Apr. 7, 2013) (describing the PTC as "just another example of a 'feel good' policy with a hefty price tag—one that America can't afford").

14 *See, e.g.*, Robert L. Bradley Jr., Op-Ed., *Where Federal Energy Subsidies Really Go*, FORBES, Aug. 15, 2011, http://www.forbes.com/sites/realspin/2011/08/15/where-federal-energy-subsidies-really-go (last visited Apr. 7, 2013) (arguing that in 2010, the oil and gas industries received only 11% of all federal energy subsidies).

15 *See infra* notes 44–47 and accompanying text.

concludes that, regardless of the particular subsidy mechanism Congress adopts, it must provide stability and certainty for wind power producers.[16]

II. THE IMPORTANCE OF SUBSIDIES IN A DISTORTED MARKET

The renewable energy industry had a banner year in 2012. Both the wind and solar industries reported record levels of facility installations and growth. By the end of 2012, the wind energy industry reported that it had installed approximately 13,000 megawatts of new capacity, outpacing even the new capacity additions of natural gas.[17] The solar industry was also on pace to have a record number of new facilities, having doubled its rate of installations during the first half of 2012.[18] Based on these figures, it might appear that the renewable energy industry has finally found its footing and that policy makers can ease back from their efforts to promote and support renewable power. In reality though, the massive deployment rates—for wind power, in particular—are a symptom of the uncertainty plaguing the renewable energy industry, as developers regularly find themselves scrambling to qualify for expiring subsidies rather than pursuing long-term growth strategies.[19] Although both wind and solar power have expanded across the United States and become more cost-competitive with fossil fuels,[20] they are still emerging industries that could decline without more consistent policy support.

Opponents have argued that renewable energy subsidies waste taxpayer money on energy sources that cannot compete on their own with fossil fuels. Of course, that is the whole point of subsidizing renewable energy: if it operated on an equal footing with fossil fuels, subsidies would not be necessary. Advocates of renewable power thus view a lack of competitiveness as the underlying rationale for subsidization. Critics of

16 Although this Essay focuses on subsidy policy as a way to promote a more sustainable wind energy industry, subsidies alone will not stabilize the industry. Several recent reports estimate that demand for wind power will drop off significantly over the next few years regardless of the PTC. To date, state Renewable Portfolio Standards (RPSs) have driven demand by requiring utilities to obtain a specified percentage of power from renewable sources. However, the growth in renewable power capacity over recent years means that existing facilities will be able to meet almost all of the RPS mandates through the year 2025. Policies designed to increase supply will have little impact if demand for renewable sources does not keep pace. Therefore, policies must address both sides of the equation. Those policies, however, are beyond the scope of this Essay.

17 U.S. Energy Info. Admin., *Wind Industry Installs Almost 5,300 MW of Capacity in December*, TODAY IN ENERGY, Feb. 11, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=9931 (last visited Apr. 7, 2013).

18 Press Release, IMS Research, America's PV Market Grew 120% in First Half of 2012; USA to Become 3rd Largest Market in 2012 (Aug. 22, 2012), http://imsresearch.com/press-release/Americas_PV_Market_Grew_120_in_First_Half_of_2012_USA_to_Become_3rd_Largest_Market_in_2012 (last visited Apr. 7, 2013).

19 *See* U.S. Energy Info. Admin., *supra* note 17 (linking the increase in wind power production during 2012 to the scheduled expiration of the PTC).

20 *Wind and Solar Energy Are Becoming Cost Competitive*, MOTHER NATURE NETWORK, Mar. 23, 2011, http://www.mnn.com/earth-matters/energy/stories/wind-and-solar-energy-are-becoming-cost-competitive# (last visited Apr. 7, 2013).

subsidies, not surprisingly, take the opposite view. In essence, they argue that subsidies distort the market by improperly allowing the government to pick winners and losers.[21] This argument disregards the myriad ways existing policies already favor certain energy producers and thus expressly or implicitly select winners. For example, various policies allow companies to externalize their costs—including their central role in accelerating climate change—on society and thereby maintain artificially low prices. Anti-subsidy critiques are also premised on a fundamental misunderstanding of the role of the market in the electricity sector. As this Part explains, while strategies other than subsidies may correct the flaws in the electricity market, subsidies are among the few strategies that receive support in today's political environment.

A. Climate Change, Externalities, and Fossil Fuels

It is no secret that fossil fuels cause significant environmental and public health damage that market prices fail to reflect. Indeed, most studies that attempt to calculate externalized costs fail to consider the full scope of this damage, and thus, likely underestimate the social costs of fossil fuels. Nonetheless, when one considers the harm caused by fossil fuels in the electricity sector, namely by coal and natural gas, it is clear that the extraction, transportation, and combustion of these fuels exact enormous societal costs.

Coal has rightly earned a notorious reputation for harming people and the environment. Historically, underground mining exacted an enormous human toll. As "one of the few occupations in which a person faced a very real risk of death by all four classical elements," it "was probably the most dangerous profession of a dangerous time."[22] Underground miners could die from carbon dioxide asphyxiation, carbon monoxide poisoning, immolation by methane-induced fires and explosions, not to mention cave-ins and floods.[23] Property owners above the mines could lose their lands and homes to subsidence, and often lacked a legal remedy for the damages they suffered.[24] Although laws eventually developed to protect coal miners and prevent subsidence, coal production and consumption continue to have devastating impacts. Today, coal extraction, particularly mountaintop mining, buries streams beneath miles of overburden, contaminates drinking water, and destroys habitat for plants and animals.[25] Coal combustion releases particulate matter, sulfur dioxide, nitrogen oxides, and toxic

21 *See, e.g.*, Nicolas Loris, *Wind PTC: There's No Free Lunch*, THE FOUNDRY: CONSERVATIVE POLICY NEWS BLOG (June 21, 2012), http://blog.heritage.org/2012/06/21/wind-ptc-theres-no-free-lunch (last visited Apr. 7, 2013).

22 BARBARA FREESE, COAL: A HUMAN HISTORY 47 (2003).

23 *Id.* at 47–55, 139.

24 *See* Pa. Coal Co. v. Mahon, 260 U.S. 393, 412–16 (1922) (striking down state legislation attempting to regulate subsidence caused by coal mining).

25 M. A. Palmer et al., *Mountaintop Mining Consequences*, 327 SCIENCE 148, 148–49 (2010), *available at* http://www.sciencemag.org/content/327/5962/148.full.pdf.

pollutants that cause or contribute to human health problems like asthma, heart disease, and lung diseases, as well as cause acid rain, smog formation, visible haze, and mercury contamination in the environment.[26] And, of course, miners continue to die when mining shafts collapse or fires erupt. Although regulatory controls could prevent or reduce many of these problems, domestic laws have long allowed coal mining and combustion to escape serious regulation.[27]

Natural gas is also becoming an increasingly harmful fuel in the electricity sector, due to the expanded use of hydraulic fracturing (fracking) technologies that allow gas companies to access previously unavailable natural gas deposits. Natural gas production and combustion have potential links to drinking-water contamination, property damage, and habitat loss.[28] Natural gas production also emits many of the same air pollutants as coal, albeit in lower amounts, as well as toxic pollutants like benzene. As with coal, natural gas has benefited from numerous exemptions from environmental laws, including statutory exemptions from the Safe Drinking Water Act[29] and a pervasive lack of regulation by the U.S. Environmental Protection Agency and many state environmental agencies.[30]

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26 CLEAN AIR TASK FORCE, CRADLE TO GRAVE: THE ENVIRONMENTAL IMPACTS FROM COAL 1, 3–7 (2001), *available at* www.catf.us/resources/publications/files/Cradle_to_Grave.pdf.

27 *See e.g.*, Palmer et al., *supra* note 25, at 149 (describing "inadequate" regulation of mountaintop mining and valley fills under the Clean Water Act and the Surface Mining Control and Reclamation Act); Daniel S. Cohan & Catherine Douglass, *Potential Emissions Reductions from Grandfathered Coal Power Plants in the United States*, 39 ENERGY POL'Y 4816, 4816 (2011) (noting that grandfathering provisions of the Clean Air Act have allowed existing coal-fired power plants to, *inter alia*, "avoid the regulatory hurdles of new construction" applicable under the New Source Performance Standards).

28 Lucy Allen et al., *Fossil Fuels and Water Quality*, *in* 7 THE WORLD'S WATER: THE BIENNIAL REPORT ON FRESHWATER RESOURCES 73, 79, 85–86 (2011), *available at* http://www.worldwater.org/datav7/chapter_4_fossil_fuel_and_water_quality.pdf.

29 42 U.S.C. § 300h(d)(1)(B)(ii) (2006) ("The term 'underground injection' excludes . . . the underground injection of fluids or propping agents . . . pursuant to hydraulic fracturing operations.").

30 *See, e.g.*, Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes, 53 Fed. Reg. 25,446, 25,447 (July 6, 1988) (exempting wastes generated by natural gas exploration, development, and production from regulation as hazardous waste under RCRA); 40 C.F.R. § 122.26(a)(2) (2005) (exempting certain discharges by natural gas exploration, production, processing, and treatment operations from NPDES permitting requirements); 33 Pa. Bull. 3676, 3678 (July 25, 2003) (exempting certain natural gas exploration and production operations from pre-approval and permitting requirements applicable to new sources of emissions); N.M. CODE R. § 19.15.16.19(B) (2013) (exempting well operators from reporting information about the composition of hydraulic fracturing fluid if the operators claim that the information is a trade secret or confidential business information). *But see, e.g.*, Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 77 Fed. Reg. 49,490, 49,517 (Aug. 16, 2012) (to be codified at 40 C.F.R. § 60.5375) (regulating "flowback" emissions of volatile organic compounds from hydraulic refracturing under the Clean Air Act's New Source Performance Standards); VT. STAT. ANN. tit. 29, § 571(a) (2012) (banning hydraulic fracturing in Vermont).

Coal and natural gas consumption also exacerbate climate change, "arguably the most far-reaching market failure ever."[31] In 2010, the entire electricity sector accounted for about 34% of U.S. greenhouse gas emissions.[32] Coal plants, which produced about 45% of U.S. power in 2010, contributed about 81% of the electricity sector's carbon dioxide emissions that year.[33] Recent declines in natural gas prices, however, have reduced coal's market share, and thus indirectly driven down carbon dioxide emissions from coal plants.[34] As a result, electricity sector emissions fell by about 4.6% in 2011.[35] While this data may suggest that natural gas has a beneficial impact on climate change by displacing coal-fired power plants, it does not paint a complete picture of the lifecycle emissions from natural gas production, transportation, and combustion. Indeed, recent studies indicate that natural gas lifecycle emissions of methane—a much more potent greenhouse gas than carbon dioxide—may offset the potential climate benefits of replacing coal with natural gas.[36] Thus, both coal and natural gas are major contributors to climate change and the harms it exacts.

While the environmental and health consequences of fossil fuel use are apparent, it is extraordinarily difficult to place a price tag on these externalities. The external-cost estimates of coal, for example, have ranged from $62 billion[37] to $345 billion[38] annually, depending on the scope of externalities considered.[39] The National Academy of Sciences (NAS) has also calculated that emissions of sulfur dioxide, nitrogen oxides, and particulate

31 NICOLAS STERN ET AL., STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE i, *available at* http://www.hm-treasury.gov.uk/sternreview_index.htm (click on the "Full Report" hyperlink, then, towards the bottom of the page, click on "Part I: Climate Change: Our Approach (Chapters 1–2)").

32 U.S. Envtl. Prot. Agency, *Sources of Greenhouse Gas Emissions*: *Electricity Sector Emissions*, http://www.epa.gov/climatechange/ghgemissions/sources/electricity.html (last visited Apr. 7, 2013).

33 *Id.*

34 *See* U.S. Energy Info. Admin., *U.S. Energy-Related CO2 Emissions in Early 2012 Lowest Since 1992*, TODAY IN ENERGY, Aug. 1, 2012, http://www.eia.gov/todayinenergy/detail.cfm?id=7350 (last visited Apr. 7, 2013).

35 Press Release, U.S. Envtl. Prot. Agency, EPA Updates Greenhouse Gas Emissions Data from Large Facilities (Feb. 5, 2013), http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/715f5837da2615ef85257b09005ea7af!OpenDocument (last visited Apr. 7, 2013).

36 Robert W. Howarth et al., *Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al.*, 113 CLIMATE CHANGE 537, 542, 544 (2012); Jeff Tollefson, *Air Sampling Reveals High Emissions from Gas Field: Methane Leaks During Production May Offset Climate Benefits of Natural Gas*, NATURE: NEWS, Feb. 7. 2012, http://www.nature.com/news/air-sampling-reveals-high-emissions-from-gas-field-1.9982 (last visited Apr. 7, 2013).

37 NAT'L ACAD. OF SCIENCES, HIDDEN COSTS OF ENERGY: UNPRICED CONSEQUENCES OF ENERGY PRODUCTION AND USE 149 (2010).

38 Paul R. Epstein et al., *Full Cost Accounting for the Life Cycle of Coal*, 1219 ANNALS N.Y. ACAD. SCI., Feb. 2011, at 73, 91.

39 *Compare* NAT'L ACAD. OF SCIENCES, *supra* note 37, at 6 (calculating the costs to human health and the environment from emissions of particulate matter, sulfur dioxide, and nitrogen oxides, but failing to consider the costs to human health or the environment from climate change, mercury emissions, or other toxic pollutants), *with* Epstein et al., *supra* note 38, at 75 (factoring in the lifecycle impacts from coal extraction, transportation, combustion, and waste management, and considering the costs of climate change).

matter from natural gas power plants amount to $740 million in externalized costs per year, but these figures exclude the full lifecycle emissions from natural gas production, transportation, and combustion.[40] Similarly, while the NAS study did estimate climate-related damages from natural gas combustion at power plants,[41] it did not calculate the full lifecycle emissions of greenhouse gas from natural gas production and transportation.[42] Yet, as noted above, these phases of the natural gas lifecycle have a much greater impact on climate change. As a consequence, studies that attempt to calculate the externalities from fossil fuels have typically underestimated their total value. While it may be impossible to establish a precise number for the external costs of fossil fuels used in the electricity sector, it is clear that they far exceed the externalized costs of renewable power sources.[43]

B. The Flawed Arguments of Subsidy Opponents

Opponents of renewable power subsidies usually do not confront the externalized cost estimates head-on. Nor do they discuss how externalities have distorted the electricity market for decades. Instead, subsidy opponents often argue that renewable energy can easily compete with fossil fuels if Congress simply repeals all subsidies. Renewable energy subsidy opponents also suggest that the development of a broader free market in the electricity sector will allow renewable power to become competitive. None of these arguments offers a realistic approach for addressing the distorted economic advantages that fossil fuels receive and have received for decades.

1. Fossil Fuel Subsidy Reforms Are Inadequate

Those who oppose renewable power subsidies argue that subsidy reform for fossil fuels could effectively level the playing field to make renewable energy competitive on its own.[44] But even assuming that fossil fuel subsidy reform were politically feasible—and this is a huge assumption—the structural advantages that fossil fuels have received as a result of historical subsidies and externalized costs would make it nearly impossible for renewable energy sources to catch up within a reasonable time frame. Renewable energy sources are less competitive with fossil fuels precisely because fossil fuels have benefited from a long history of government largess and lax regulation. While subsidy opponents are correct that governments should quit subsidizing fossil fuels, they are wrong to suggest that this would automatically level the playing field for renewable power.

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40 NAT'L ACAD. OF SCIENCES, *supra* note 37, at 8.

41 *Id.* at 19 (calculating from an assumed $30 per ton of carbon-dioxide equivalent, or CO_2-eq, emissions).

42 *Id.* at 116.

43 *Id.* at 10 (noting that the lifecycle carbon dioxide emissions from, *inter alia*, wind, biomass, and solar "appear so small as to be negligible compared with those from fossil fuels").

44 *See* Loris, *supra* note 21 (arguing for a repeal of all energy subsidies, starting with the PTC).

Natural gas and oil, for example, have benefited from more than a century of federal subsidies supporting research and development, increased production, fuel transportation, and facility construction. Although the exact values of historical subsidies are difficult to track, a recent study estimates that oil and gas subsidies over the past 100 years equal, on average, about $4.86 billion annually—more than thirteen times the average annual subsidies to renewable energy sources in recent years.[45] These disparities, however, do not paint a complete picture; rather, what matters most is how historical subsidies enabled coal and natural gas to gain market share and become important electricity fuels today. For example, government subsidies led to the creation of combustion turbines capable of producing electricity from natural gas.[46] Such subsidies also financed modern hydraulic fracturing technologies that have enabled companies to extract natural gas from shale and other diffuse natural gas deposits previously considered inaccessible.[47] These innovations, in turn, have led to cheap natural gas prices that have driven down wholesale electricity prices and made it difficult for renewable power to compete. Even if natural gas subsidies stopped today, the industry has already gained a competitive advantage over emerging renewable technologies. Thus, the argument that subsidy reform for all energy resources would level the playing field for renewables is false.

This subsidy reform argument also ignores the economic advantages that fossil fuels have in terms of externalities. Even if Congress were to miraculously repeal all tax breaks, tax credits, and other subsidies for fossil fuels, renewable power would still be at a competitive disadvantage because fossil fuel prices do not account for the many externalities imposed on society. Fossil fuels are cheap, in part, because their market prices do not reflect their full costs. Until regulations force fossil fuel companies to internalize their full societal costs, mere subsidy reform aimed at fossil fuels will not level the playing field for renewable power.

2. The Electricity Sector Is Not a Free Market

A final argument advanced by critics is that renewable power subsidies disrupt the free market, and that the market itself should decide which types of power receive consumers' support.[48] As the above Sections make clear,

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45 NANCY PFUND & BEN HEALEY, WHAT WOULD JEFFERSON DO? THE HISTORICAL ROLE OF FEDERAL SUBSIDIES IN SHAPING AMERICA'S ENERGY FUTURE 7 (2011), *available at* http://www.dblinvestors.com/documents/What-Would-Jefferson-Do-Final-Version.pdf (comparing average annual oil and gas subsidies from 1918–2009 with average renewable subsidies from 1994–2009).

46 *Id.* at 35 (noting government subsidies made competitive "once uneconomic" natural gas combustion turbines).

47 Michael Shellenberger et al., *Where the Shale Gas Revolution Came From: Government's Role in the Development of Hydraulic Fracturing in Shale*, BREAKTHROUGH INST. May 23, 2012, http://thebreakthrough.org/index.php/programs/energy-and-climate/where-the-shale-gas-revolution-came-from (last visited Apr. 7, 2013).

48 *See* Loris, *supra* note 21 ("real market-based policy doesn't include special interest subsidies").

the energy market is already distorted by externalities and historical subsidies. More fundamentally, the electricity system itself is not a free market, so market principles have very little applicability to the fuel mix that utilities use.

Since the early 1900s, most states have regulated electricity utilities as natural monopolies.[49] Under typical regulatory schemes, state Public Utility Commissions (PUCs) regulate the types of investments utilities make, the rates they charge their consumers, the presumptive revenues those utilities may earn, and the resource mix they use to obtain power.[50] In the majority of states, utilities are vertically integrated, meaning they produce the power that they provide to their end-users. Whenever these utilities seek to build new power plants, they must justify their decisions to a PUC before building the plant or collecting revenue for construction costs.[51] Most PUCs, in turn, operate under legislative mandates requiring electricity to come from "least-cost" resources. While some states have broadened the considerations utilities may make when building power plants or procuring power, the least-cost mandate remains dominant.[52] Today, natural gas-based electricity often satisfies this mandate, due in part to the economic advantages the natural gas industry has received from historical subsidies and lax regulations. Thus, the market failures discussed above skew utility investments toward fossil fuels as least-cost resources.

Even in states that have restructured—exposing utilities to some degree of competition—the market still plays a limited role in the choice of resource mix. In most of these states, monopolies still provide retail power to consumers and must still choose the resource mix pursuant to least-cost or other cost-oriented mandates. Electricity end-users rarely get a choice regarding the types of power they receive. While some retail customers do have choices of power suppliers—and have at times chosen to receive renewable power—these limited situations do not convert the electricity sector into a free market.

Thus, arguments about the free market in the electricity sector are fundamentally misplaced. The very structure of the electricity sector belies the idea that free-market principles could somehow enable renewable

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49 U.S. ENERGY INFO. ADMIN., DOE/EIA-0562(00), THE CHANGING STRUCTURE OF THE ELECTRIC POWER INDUSTRY 2000: AN UPDATE 5 (2000), *available at* http://www.eia.gov/cneaf/electricity/chg_stru_update/update2000.pdf.

50 *See* CTR. FOR CLIMATE CHANGE LAW, COLUMBIA LAW SCH., PUBLIC UTILITY COMMISSIONS AND ENERGY EFFICIENCY: A HANDBOOK OF LEGAL & REGULATORY TOOLS FOR COMMISSIONERS AND ADVOCATES 5, 20, 24, 31, 47, (2012), *available at* https://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=611933 (discussing the authority of PUCs and how they can "promote energy efficiency").

51 *See* Richard J. Pierce Jr., *The Regulatory Treatment of Mistakes in Retrospect: Canceled Plants and Excess Capacity*, 132 U. PA. L. REV. 497, 532 (1984).

52 *See generally* RACHEL WILSON & PAUL PETERSON, SYNAPSE ENERGY ECON., INC., A BRIEF SURVEY OF STATE INTEGRATED RESOURCE PLANNING RULES AND REQUIREMENTS (2011), *available at* http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf (discussing various state policies that allow for the consideration of different factors in utility planning, but that ultimately require utilities to employ the "least-cost" approach to selecting a resource procurement plan).

power sources to thrive. Moreover, the cost distortions due to externalities and historical subsidies make it difficult for renewable power to compete with fossil fuels, particularly natural gas. Other corrective measures, such as increased environmental regulation to minimize externalities and increased taxes to recover historical fossil fuel subsidies, could theoretically level the playing field between fossil fuels and renewable sources. The likelihood that government agencies would implement such measures, however, is exceedingly small. In today's political environment, subsidies provide the best hope for enabling renewable power to become competitive. Yet, for subsidies to work, they must provide long-term, predictable support. As the next Part describes, the dominant renewable energy subsidies do the exact opposite.

III. THE EFFECTIVE, BUT UNSTABLE, PTC

Since 1992, the PTC has served as the primary incentive for wind power development. The PTC allows qualifying facilities to earn inflation-adjusted tax credits, currently 2.2¢, for each kilowatt of electricity they deliver to the grid.[53] To be eligible for the PTC, wind power companies must build their facilities by specified deadlines.[54] Once a facility becomes eligible for the PTC, wind companies may receive production-based credits for the first ten years of a facility's operation.[55] Although the value of the credits may decline if the market price of electricity increases to a specified amount—obviating the need for a full subsidy—production levels do not directly affect the availability or value of credits.[56] Renewable energy experts attribute a substantial amount of the growth in renewable energy facilities, and particularly wind farms, to the PTC.[57]

Despite the success of the PTC in promoting wind power, Congress has had a fickle attitude toward the policy. The PTC expired three times between 1999 and 2005, and expired again at the end of 2012.[58] Whenever the

53 *See* I.R.C. § 45(a), (b) (2012) (setting the PTC at an initial 1.5¢/kWh in 1993 dollars, and allowing for inflation adjustments); RYAN WISER & MARK BOLINGER, U.S. DEP'T OF ENERGY, 2009 WIND TECHNOLOGIES MARKET REPORT 57 (2010), *available at* http://www.nrel.gov/docs/fy10osti/48666.pdf [hereinafter 2009 WIND TECHNOLOGIES MARKET REPORT] (noting that after adjusting for inflation, the PTC amounts to 2.2¢/kWh today).

54 American Taxpayer Relief Act of 2012, Pub. L. No. 112-240, § 407(a)(1), 126 Stat. 2340 (2013) (to be codified at I.R.C. § 45) (requiring eligible facilities to begin construction before January 1, 2014). Under the previous PTC, developers were required to complete construction and place facilities in service before January 1, 2013. *See* Roberta F. Mann & E. Margaret Rowe, *Taxation*, *in* THE LAW OF CLEAN ENERGY: EFFICIENCY AND RENEWABLES 145, 148 (Michael B. Gerrard ed., 2011).

55 I.R.C. § 45(a)(2)(A)(ii) (2012).

56 *See* Mann & Rowe, *supra* note 54, at 147–48 (citing I.R.C. § 45(b)(1)).

57 *See* 2009 WIND TECHNOLOGIES MARKET REPORT, *supra* note 53.

58 AM. WIND ENERGY ASS'N, FEDERAL PRODUCTION TAX CREDIT FOR WIND ENERGY: THE AMERICAN WIND INDUSTRY URGES CONGRESS TO TAKE IMMEDIATE ACTION TO PASS AN EXTENSION OF THE PTC, *available at* http://www.awea.org/issues/federal_policy/upload/PTC-Fact-Sheet.pdf [hereinafter AWEA PTC FACT SHEET]; *see also* Erin Dewey, Note, *Sundown and You Better Take Care:*

credits have expired, investment in wind energy has stagnated and growth in the renewables industry has stopped.[59] Restoration of the tax credits has typically spurred new rounds of investment and redevelopment, but usually only when the tax-credit extension lasts multiple years.[60] The on-again, off-again development cycle promotes a rush mentality when the tax credit is available,[61] followed by a decline whenever it expires.[62] This boom-and-bust cycle threatens the overall stability of the renewable energy sector.

A. The Economic Consequences of the Unstable PTC

These intermittent subsidies have significant impacts on the wind energy market and its long-term viability. They create instability in the wind energy industry's labor force, and disrupt manufacturing processes and supply chains. In turn, these disruptions impair the industry's ability to respond quickly to renewed tax credits or other market forces that could incentivize additional energy production. The intermittent subsidies also lead to inflated prices for goods and labor, as actors in the wind energy industry seek to offset foreseeable lulls in production and demand by raising prices during the times when the PTC is in effect. Finally, the intermittent subsidies likely affect the bargaining power of wind developers when they negotiate power purchase agreements (PPAs), because utilities know that wind developers must make a deal to be able to sell their power to qualify for the PTC. Ultimately, the sporadic nature of these subsidies affects the efficiency and sustainability of the entire wind industry.

The unstable PTC has substantial impacts on the wind energy industry's labor force, which expands and contracts depending on the status of the tax credit. When the tax credit is available, wind developers must send employees to negotiate deals with landowners for facility siting, acquire siting permits and other authorizations, as well as negotiate PPAs with utilities. Through its employees, a wind developer can also participate in public utility commission hearings to ensure approval of the PPAs, negotiate contracts for the purchase of the turbines, and, ultimately, build new facilities.[63] Wind power companies thus require a significant number of employees to do the upfront preparations, but as the expiration date of the

Why Sunset Provisions Harm the Renewable Energy Industry and Violate Tax Principles, 52 B.C. L. REV. 1105, 1119 & n.112 (2011) (listing the various extensions of the PTC since its inception).

59 *See* AWEA PTC FACT SHEET, *supra* note 55.

60 *Id.*

61 When Congress has renewed the PTC in the past, facility construction has spiked the following year. *See id.* Similarly, when the PTC is nearing expiration, installation spikes again as companies rush to meet the eligibility deadline. RYAN WISER & MARK BOLINGER, U.S. DEP'T OF ENERGY, 2011 WIND TECHNOLOGIES MARKET REPORT 3 (2012), *available at* http://www1.eere.energy.gov/wind/pdfs/2011_wind_technologies_market_report.pdf [hereinafter 2011 WIND TECHNOLOGIES MARKET REPORT].

62 *See* Press Release, Am. Wind Energy Ass'n, Layoffs Mount in U.S. Wind Power Manufacturing Plants This Week (Aug. 9, 2012), http://www.awea.org/newsroom/pressreleases/layoffs_mounting.cfm (last visited Apr. 7, 2013).

63 *See* Einowski, *supra* note 8.

PTC nears, the need for these employees dissipates. There is simply no need for wind developers to keep staff on the payroll if future wind facilities will not qualify for the PTC. Not surprisingly, then, the first wave of layoffs typically involves those involved in project development. At the end of a PTC expiration year, another round of layoffs occurs when those involved in the actual construction activities lose their jobs. A similar scenario plays out with wind turbine and equipment manufacturers, who will likely shed employees, and may even close their facilities, when orders for new equipment dry up as the PTC becomes unavailable.[64]

Renewal of the PTC does not result in an automatic buildup of the previous labor force. Some companies will delay hiring if a PTC extension lasts only a short time, as the 2013 extension does.[65] Even where a PTC renewal extends the subsidy for multiple years, it can take several months for the wind industry to ramp back up.[66] Wind developers must either rehire laid-off employees or train new ones to develop new facilities, to negotiate new contracts, and to navigate the siting and permitting process. Training new employees takes time and costs money for wind developers, so securing an adequate workforce will be slow at first. In many cases, wind developers will order turbines and other equipment only after they have negotiated a PPA with a utility, so it may take months before equipment manufacturers receive enough orders to justify rehiring laid-off workers or training new ones.[67] Similarly, if a manufacturer closed a plant during a PTC suspension, the manufacturer will need to reestablish supply chains and get the plant up and running before it can begin production. These start-up costs, measured in dollars and days, can significantly delay the deployment of turbines and other equipment.

The cycle of layoffs and plant closures can occur even if Congress ultimately renews the PTC, if renewal occurs too late. With the most recent expiration of the PTC on December 31, 2012, for example, proposals to develop new wind farms began to decline in the last quarter of 2011.[68] Practically speaking, any proposed wind farm that had not already received necessary permits by then would be unlikely to qualify for the PTC by the

64 *See* Carl Dunker, *Too Little, Too Late? Buzzer-Beating PTC Extension May Not be Enough*, MIBIZ MAG., Jan. 20, 2013, http://mibiz.com/news/energy/item/20379-too-little-too-late?-buzzer-beating-ptc-extension-may-not-be-enough (last visited Apr. 7, 2013).

65 *See* Am. Wind Energy Ass'n, *Manufacturing Execs Voice Dismay Over Lack of Action on PTC*, WIND ENERGY SMARTBRIEF, Aug. 29, 2012, http://www.smartbrief.com/08/28/12/manufacturing-execs-voice-dismay-over-lack-action-ptc#.UWHFL1fB98E (last visited Apr. 7, 2013).

66 *See* Dunker, *supra* note 64.

67 *See* Einowski, *supra* note 8; *see also* Ros Davidson, *Analysts Predict PTC Extension Will Fail to Lift U.S. Wind Sector*, WIND POWER MONTHLY, Jan. 4, 2013, http://www.windpowermonthly.com/article/1165623/Analysts-predict-PTC-extension-will-fail-lift-US-wind-sector (last visited Apr. 7, 2013) (noting the growth in the wind industry is not expected to pick up until the second half of 2013 despite the PTC's renewal).

68 Personal communication from Elon Hasson, Development Manager, E.ON Climate & Renewables, to Melissa Powers, Associate Professor of Law, Lewis & Clark Law School, Oct. 19, 2011.

end of the following year.[69] Accordingly, layoffs in the wind energy industry began in 2011, as projects dried up and manufacturers received very few new equipment orders. Although 2012 was a banner year in terms of new facilities coming on line, most of the development work for those facilities had ended a year before. Thus, even though Congress renewed the PTC only a couple of days after it expired, the economic harms of the expiration began at least a year earlier. This makes the transition back to robust development and manufacturing levels that much slower, as many laid-off employees will presumably have moved on to other jobs.[70]

The intermittent subsidies also lead to distorted prices when the subsidy is in effect and an expiration date looms, as well as once it expires and renewal is pending.[71] Almost every actor in the wind power industry is aware that developers must operate within tight timeframes to qualify for the PTC. Land prices, labor prices, and equipment prices all spike as the window for development begins to close. This drives up the costs of building wind farms. On the other side, utilities and other wind power purchasers know that the operators of wind farms must sell their power to qualify for the PTC. This gives them greater bargaining power with the wind energy producers, and thus drives the wholesale prices for wind power down.[72] In short, the looming deadlines associated with the intermittent PTC inflate the costs of development and depress the rates wind farms can charge for their power. This dynamic only increases the wind power industry's reliance on subsidies and other economic support.[73]

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69 *See* Einowski, *supra* note 8 (noting that wind projects face significant challenges in completing construction within the one-year time frame).

70 *See* Dunker, *supra* note 64 (quoting a wind energy executive's discussion of "ramp[ing] back up over the next few years").

71 *See* Merrill Jones Barradale, *Impact of Policy Uncertainty on Renewable Energy Investment: Wind Power and the PTC* 5, 6 fig.1 (Working Paper rev. ed. Aug. 2009), *available at* http://ssrn.com/abstract=1085063.

72 *See* Alexandra Klass & Lesley McAllister, *Subsidizing in Spurts: Our Production Tax Credit Policy, or Lack Thereof*, CPR BLOG (Feb. 12, 2013), http://www.progressivereform.org/CPRBlog.cfm?idBlog=CEA8C992-BD12-B999-EF92A40AE2F89CD6 (last visited Apr. 7, 2013).

73 Although it is too soon to know how the recent IRS guidance will affect the wind industry, it does not seem designed to avoid another rush to build. Under the IRS guidance, facilities may qualify for the PTC if a developer has started "physical work of a significant nature" or meets the safe harbor provisions by January 1, 2014. IRS PTC Guidance, *supra* note 10, §3. Both methods of compliance run the risk of spurring another building boom and associated price spikes.

Under the first method, a developer must start some sort of physical work before January 1, 2014, and maintain a continuous program of construction thereafter to qualify for the PTC. *Id.* Project design, permitting, and contract negotiations do not qualify as physical work. *Id.* §4. Accordingly, developers will still face escalating costs associated with labor, permitting, and contract negotiations, as well as downward price pressure for the electricity sold through PPAs, because everyone in the industry will know that developers must have preliminary work complete and PPAs signed before they can begin physical construction. With an eight-month window from the date the IRS issued its guidance to the end of the year, a boom mentality seems almost inevitable.

The second method could conceivably mitigate these risks, because it ties eligibility for the PTC to the costs incurred in the facility, rather than to the facility's physical construction. *Id.* §5. Presumably, this would give developers more time to negotiate contracts and plan their

B. The Political Consequences of the Unstable PTC

The intermittent PTC also intensifies the wind power industry's political vulnerability by requiring the industry to continually seek extensions from Congress. The political debate surrounding each extension, combined with the difficulty of getting Congress to act, can diminish the likelihood that Congress will in fact renew an expiring PTC. This intermittency can also paint a distorted picture of the renewable energy industry as a whole, because it may give the public the false impression that the renewable power sector is unique among the energy industry in receiving subsidies. This, in turn, can weaken public and political support for future government subsidies.

One need only consider the debate leading up to the 2013 PTC renewal to get a sense of how the renewable energy industry comes under attack regarding subsidy extensions. Throughout 2012, commentators wrote multiple op-eds about the PTC and the wind energy industry generally. Detractors claimed that the PTC propped up an industry that cannot hack it on its own,[74] and was a profligate expense since the subsidies at times exceeded the market price of electricity.[75] In addition, they argued that the PTC cost taxpayers an inordinate amount of money for the number of jobs it created,[76] and amounted to the government improperly picking "winners and losers" among different energy sources.[77] Although some of these commentators may have, as an aside, argued for elimination of all subsidies as a demonstration of their "free-market" principles,[78] they focused the brunt of their attacks on renewable energy subsidies.[79] The public debate about the

sites. After all, they would only need to incur costs totaling 5% of the facility to qualify for the PTC. Thus, wind developers might attempt to purchase only a fraction of the turbines they will ultimately install before January 1, 2014, knowing that the market will calm down and turbine prices will decline after the deadline. Of course, wind turbine manufacturers will know this, too, and they might refuse to sign contracts for portions of a project if they cannot extract higher prices. Ultimately, as the January 1, 2014, deadline nears, one of the parties will blink or both of the parties will compromise. Either way, the costs of development will have increased due to the negotiations or escalated equipment prices, or both. Thus, while the safe harbor method may mitigate some of the rush mentality, it will probably not eliminate it. Uncertainty seems likely to persist throughout 2013.

74 Stverak, *supra* note 13 (calling wind energy "a hopeless industry").

75 *Id.*

76 Benn Steil, Dinah Walker & Romil Chouhan, Op-Ed., *President Obama's Green Jobs Cost Taxpayers Big Bucks*, FORBES, Nov. 2, 2012, http://www.forbes.com/sites/realspin/2012/11/02/president-obamas-green-jobs-cost-taxpayers-big-bucks (last visited Apr. 7, 2013) ("Wind jobs cost taxpayers nearly $47,000 per job per year.").

77 *See, e.g.*, Loris, *supra* note 21 (characterizing subsidies as "an inefficient and inherently unfair system of picking winners and losers").

78 *See id.*

79 Although the Heritage Foundation advocates for the repeal of many energy subsidies, it defines subsidies narrowly and thus justifies continuation of tax credits and policies that favor fossil fuels. *See* Nicolas Loris & Curtis S. Dubay, *What's an Oil Subsidy?*, HERITAGE FOUND., May 12, 2011, http://www.heritage.org/research/reports/2011/05/whats-an-oil-subsidy (last visited Feb. 22, 2013). The article's discussion of subsidies does not include any mention of externalities.

PTC even entered the 2012 presidential campaign, with candidate Mitt Romney opposing it in order to "end the stimulus boondoggles and create a level playing field on which all sources of energy can compete on their merits,"[80] and President Obama supporting it as a boost to jobs.[81] While the electorate seemed to support the policy as a jobs-creation bill, one must wonder if the same outcome would result in a different economic time. Nonetheless, missing from the debate was a broader discussion about externalities and the unsustainable nature of our existing energy policy.

Intermittent renewable power subsidies also provide further advantage to fossil fuels, which receive subsidies that are essentially permanent. Fossil fuel subsidy reform requires affirmative action by Congress and the President, yet inertia usually prevails in Washington, D.C. This inertia provides a distorted advantage to fossil fuels, because their subsidies will persist *unless* Congress acts, whereas renewable power subsidies, in contrast, will continue only *if* Congress acts.[82] In an age of legislative gridlock, awaiting congressional action can become an exercise in frustration, as the wind energy industry knows all too well.[83]

IV. ALTERNATIVES TO INTERMITTENCY

Few would dispute that intermittent subsidies provide a suboptimal strategy for supporting the renewable energy industry. The question then becomes: What other approaches should governments use to support a transition away from fossil fuels and toward renewable power? More specifically, how can Congress support the wind energy industry's development without exposing it to the boom-and-bust cycle of the PTC?

Congress could take a number of different approaches to improve subsidies, and thus increase certainty in the renewable energy sector. Two

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80 Laura DiMugno, *Mitt Romney Campaign: Let the Wind Energy Production Tax Credit Die*, N. AM. WINDPOWER, July 31, 2012, http://www.nawindpower.com/e107_plugins/content/content.php?content.10204 (last visited Apr. 7, 2013).

81 Andrew Restuccia, *Mitt Romney Would Blow Off Wind Tax Credit*, POLITICO, July 31, 2012, http://www.politico.com/news/stories/0712/79227.html (last visited Apr. 7, 2013).

82 *See* Dewey, *supra* note 58, at 1122; *see also* Christopher Riti, Comment, *Three Sheets to the Wind: The Renewable Energy Production Tax Credit, Congressional Political Posturing, and an Unsustainable Energy Policy*, 27 PACE ENVTL. L. REV. 783, 798 (2010) (discussing opposition to reducing subsidies for oil and gas as a means to pay for renewable energy subsidies).

83 As the D.C. Circuit recently characterized the legislative process:

> We have serious doubts as to whether, for standing purposes, it is ever "likely" that Congress will enact legislation at all. After all, a proposed bill must make it through committees in both the House of Representatives and the Senate and garner a majority of votes in both chambers—overcoming, perhaps, a filibuster in the Senate. If passed, the bill must then be signed into law by the President, or go back to Congress so that it may attempt to override his veto. As a generation of schoolchildren knows, "by that time, it's very unlikely that [a bill will] become a law. It's not easy to become a law."

Coal. for Responsible Regulation, Inc. v. U.S. Envtl. Prot. Agency, 684 F.3d 102, 147 (D.C. Cir. 2012) (per curiam) (alteration in original) (quoting *Schoolhouse Rock: I'm Just a Bill* (ABC television broadcast 1975), *available at* http://vimeo.com/24334724).

options stand out as potentially viable, because they are based on existing policies and have proven their efficacy. First, Congress could enact a modified PTC that would extend the eligibility deadlines for several years and decrease the subsidy amount over time to allow the industry to transition to market prices. The American Wind Energy Association (AWEA) proposed a similar arrangement as part of its efforts to get the PTC renewed in 2012.[84] Second, Congress could replace the PTC with treasury grants similar to those it created as part of the 2009 stimulus bill,[85] as the Climate Policy Initiative (CPI) has proposed.[86] While each policy would lessen the problems associated with intermittency, neither would necessarily settle the subsidy debate over the long term. Nonetheless, they represent viable options for the wind energy industry to pursue in this time of deep uncertainty.

A. A Modified PTC

To provide predictable support for wind energy, Congress could enact a longer-term extension of the PTC that would reduce—and ultimately phase-out—the PTC value over time. AWEA's proposed policy would have used such an approach. Specifically, AWEA proposed to extend the PTC's eligibility deadlines through the end of 2018—meaning that all facilities that are placed in service by December 31, 2018 would receive production tax credits.[87] However, the actual value of these credits would decline over time. Facilities placed in service in 2013 would earn the full 2.2¢ credit per kilowatt-hour.[88] Over the next five years, the value of the credits would decline by 10% each year, so that facilities placed in service by the end of 2018 would earn only 1.32¢ per kilowatt-hour.[89] All facilities built by the eligibility deadlines would presumably continue to earn credits for the first ten years of operation. Thus, the subsidy would remain in effect for nearly two more decades, but facility eligibility would phase out much sooner.

The proposal submitted by AWEA has several advantages. First, and perhaps most importantly, it reflects a policy that AWEA believes would keep the industry viable.[90] Second, its phase-out process would potentially allow an orderly transition away from subsidies and thus allow the industry to plan its strategy for becoming economically viable without government support. A phase-out may also prevent another boom-and-bust round

84 Letter from Denise A. Bode, CEO, Am. Wind Energy Ass'n, to Sen. Max Baucus, Chairman, S. Comm. on Finance et al. (Dec. 12, 2012), *available at* http://www.awea.org/issues/federal_policy/upload/AWEA-PTC-Letter-to-Committee-Leadership.pdf.

85 American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1603, 123 Stat. 115, 364–65 (codified as amended at I.R.C. § 48).

86 UDAY VARADARAJAN ET AL., CLIMATE POL'Y INITIATIVE, SUPPORTING RENEWABLES WHILE SAVING TAXPAYERS MONEY 5 (2012), *available at* http://climatepolicyinitiative.org/wp-content/uploads/2012/09/Supporting-Renewables-while-Saving-Taxpayers-Money.pdf.

87 Letter from Denise A. Bode, *supra* note 84.

88 *Id.*

89 *Id.*

90 *Id.*

induced by uncertainty. If the current erratic development process results primarily from the intermittent nature of the PTC,[91] then a planned phase-out date would presumably reduce that uncertainty. Finally, the gradual reduction of the value of the PTC could increase the proposal's political viability by mitigating the risk that wind developers could receive windfall subsidies if market prices of natural gas increase thereby making wind power competitive on its own.

However, an extended PTC like that proposed by AWEA will not necessarily pave the way to a sustainable wind energy industry or foreclose wind companies from seeking additional support if market prices of electricity actually decrease. It may simply provide certainty through 2018, at which point more lobbying will ensue for the creation of another round of support. Six years of certainty may be enough to allow the wind industry to gain more solid footing, but a number of other factors, including power demand, regulation of fossil fuels, and natural gas prices could affect the wind energy's competitiveness. In addition, it is unclear whether the incremental decrease in the credit values under the PTC would mitigate the "boom" mentality by making the PTC less important over time, or instead stifle future development as the credit values decline. Most wind companies already receive less than the full value of the credits due to tax equity investment arrangements.[92] Would they lessen the pace of investment if the value of tax credits declined further? AWEA's proposal does not explain how the industry would likely respond as credits decline. Thus, a modified PTC may carry some of the same risks as today's PTC, if tax credits continue to drive wind investment. While the wind energy industry would likely prefer a modified PTC to nothing at all, other policy proposals, such as the treasury grants discussed next, may offer more stable support to the industry.

B. Treasury Grants for Production

As part of the 2009 stimulus bill, Congress created a one-year treasury grant called the Section 1603 grant program that allowed wind energy companies eligible for the PTC to instead receive a one-time payment worth 30% of the capital costs of building a wind power facility.[93] The underlying rationale for the Section 1603 grants was concern that the recent economic

91 *See* Barradale, *supra* note 71 (discussing the intermittency of PTC renewals, and the resulting boom-and-bust development cycles).

92 *See* PHILLIP BROWN & MOLLY F. SHERLOCK, CONG. RESEARCH SERV., R41635, ARRA SECTION 1603 GRANTS IN LIEU OF TAX CREDITS FOR RENEWABLE ENERGY: OVERVIEW, ANALYSIS, AND POLICY OPTIONS 16–17 (2011). Tax credits offset a party's tax liability. *Id.* at 1. For a party to have tax liability, it must have net income, or profit, during the tax year. In many cases, wind energy developers have yet to earn profits and thus often do not have taxable income against which they can apply the tax credits. *Id.* at 8, 17. As a result they will sell the tax credits they earn, at a discount, to companies or investors who do have taxable income. *Id.* at 16–17. Thus, in most cases, wind developers receive less than the full value of the tax credits due to the tax-equity investment arrangement. *Id.* at 17.

93 American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1603(b)(2)(A), 123 Stat. 364 (2009); BROWN & SHERLOCK, *supra* note 88, at 2–3 & tbl.1.

crisis had weakened the tax equity market and thus eroded renewable power companies' access to capital.[94] In response, Congress agreed to allow wind energy companies to receive direct cash grants for their own investments. Many wind companies took advantage of the treasury grants in lieu of the PTC.[95] Although it is difficult to assess whether the treasury grants alone spurred investment, analysts believe treasury grants played an important role in promoting wind power development.[96]

The main advantage of direct payments over the PTC can be found when examining the cumulative tax-credit value that actually goes to support renewable power. Under the PTC, wind power companies typically earn only about two-thirds of the full value of the available tax credits as a result of tax equity investment arrangements.[97] By allowing tax equity investors to buy the tax credits, the government is effectively giving a third of the tax credit to an entity unrelated to the wind industry. In the aggregate, this arrangement makes the tax credit more expensive for the government than direct payments.[98]

To address these inefficiencies, the CPI has proposed a "taxable cash incentive for production" (TCP) that would give wind power producers direct, taxable payments for power production. The value of the TCP would change over time, based on the projected market price of power and the anticipated costs of producing wind power. Thus, if electricity market prices declined and wind power production prices escalated, the TCP value would increase to support the wind industry during a difficult time. In contrast, reduced production costs and rising electricity market prices would yield a lower TCP value. Overall, the TCP would enable the wind energy industry to remain competitive without granting it a windfall. If the wind energy industry knew it could count on a stable subsidy tied to market prices of power, rather than dates on a calendar, the industry could develop the certainty it needs to become stable over the long term.

In addition, according to the CPI, the direct payments would significantly reduce government costs, allow wind energy to remain competitive with other electricity sources, and provide the wind power industry with incentives to produce power.[99] If these projections are correct, a transition away from tax credits and toward direct payments could make continued wind support economically attractive.[100]

While the CPI's proposal has significant potential, it is unclear whether wind energy advocates will pursue its adoption. Despite the success of the

94 BROWN & SHERLOCK, *supra* note 92, at 1.

95 *Id.* at 5 fig.1 (noting total awards, as of 2010, of nearly $4.7 billion to 128 wind energy sector recipients).

96 *Id.* at 5–6.

97 VARADARAJAN ET AL., *supra* note 86, at 21.

98 *Id.* at 24, 25 fig.8.

99 *Id.* at 27.

100 On the other hand, the wind industry may benefit politically by having unrelated industries, including banking and financial services, eligible for a piece of the wind-subsidy pie through tax equity arrangements. While this may not enhance efficiency, it could protect the longevity of the tax-credit system for wind power.

Section 1603 treasury grants in spurring renewable power investment, Congress showed little interest in extending the grants after they expired. Perhaps policy makers and industry insiders have grown accustomed to the PTC, warts and all, and have less interest in exploring more effective options. If so, the modified PTC proposed by AWEA may provide the best option for stabilizing the subsidy cycle for wind producers.

V. CONCLUSION

If renewable energy generation is to become a meaningful part of the electricity system, subsidies will have to support the industry. Years of fossil fuel subsidies and the pervasiveness of externalities make it impossible for renewable power sources to compete on their own. In an ideal world, effective regulation and pricing would reduce the economic disparities between fossil fuels and renewable energy; but in the world we live in, subsidies play a vital role in bringing some level of balance to a distorted system.

Unfortunately, despite the importance of renewable energy subsidies, the PTC fails to deliver the certainty that nascent industries require. For the past two decades, the wind power industry has experienced booms and busts driven by the erratic PTC. Despite these odds, wind power capacity has expanded significantly, and it could be poised to contribute a significant amount of power to our electricity grid over the next several decades. For this to happen, Congress must establish a more predictable subsidy system. Whether Congress modifies the PTC as AWEA has proposed, uses direct payments as the CPI recommended, or uses a different program to balance the disparities between fossil fuels and renewable power, a clear signal must be sent to the wind industry, its investors, and power purchasers that wind development will remain stable and predictable over the long-term.